

WHAT IS CLAIMED:

1. A threaded insert, comprising:
at least one key, further comprising,
a substantially longitudinal tang portion including a first end, a second
end, a first face, a second face, a first side surface and a second side surface, the first
5 face and the second face being substantially parallel and having a curved profile, the
first face having a concave surface and the second face having a convex surface, the
first side surface being adjacent to the first face and the second face, the second side
surface being adjacent to the first face and the second face, and
a substantially longitudinal locking portion, the locking portion including
10 a first end, a second end and a substantially triangular cross section, the triangular cross
section forming a back face and two angled faces, the second end of the locking portion
being positioned adjacent to the first end of the tang portion, the tang portion and the
locking portion being substantially longitudinally aligned, the back face of the locking
portion being substantially longitudinally aligned with an apex of the first surface of
15 the tang portion, the intersection of the two angled faces projecting beyond an apex of
the second surface of the tang portion;
a bushing portion, further comprising,
a substantially cylindrical shape with a first end, a second end and a
central bore therethrough,
20 a surface of the central bore including female threads throughout the
length of the bushing portion,
an external surface of the bushing portion including male threads
throughout the length of the bushing portion, and
at least one slot extending substantially longitudinally throughout the
25 length of the bushing portion positioned on the external surface of the bushing portion,
the slot having a bottom surface and two wall surfaces, the two wall surfaces being
substantially parallel to each other and substantially perpendicular to the bottom

surface, the depth of the slot being greater than the depth of the male threads on the external surface;

30 the tang portion of the at least one key being positioned within the at least one slot toward the first end of the bushing portion, the edge between the first face and the first side surface of the tang portion and the edge between the first face and the second side surface of the tang portion being positioned in contact with the bottom surface of the slot in the bushing portion, the edge between the second face and the first side
35 surface of the tang portion and the edge between the second face and the second side surface of the tang portion having an interference fit with the two walls within the slot of the bushing portion;

 the locking portion of the at least one key extending beyond the first end of the bushing portion; and

40 the depth of the at least one slot of the bushing portion being sufficient that the apex of the second surface of the tang portion of the at least one key is positioned at a depth deeper than the inside diameter of the male threads on the external surface of the bushing portion and the intersection of the two angled faces of the locking portion of the at least one key is positioned at a depth shallower than the inside diameter of the
45 male threads on the external surface of the bushing portion.

2. The threaded insert of claim 1, wherein the male threads on the external surface of the bushing portion are configured to mate with a threaded hole in a parent material.

3. The threaded insert of claim 1, wherein the female threads within the central bore of the bushing portion are configured to mate with a male threaded fastener.

4. The threaded insert of claim 1, wherein the at least one key comprises four keys, the four keys being positioned approximately ninety degrees apart from each other about the circumference of the bushing portion.

5. The threaded insert of claim 1, wherein:

the first side surface of the tang portion of the at least one key is substantially perpendicular to a tangent along the first face of the tang portion at the intersection of the first side surface and the first face; and

5 the second side surface of the tang portion of the at least one key is substantially perpendicular to a tangent along the first face of the tang portion at the intersection of the second side surface and the first face.

6. The threaded insert of claim 1, wherein the angled faces of the locking portion of the at least one key taper into the second face of the tang portion of the at least one key.

7. The threaded insert of claim 6, wherein the taper includes an angled taper.

8. The threaded insert of claim 6, wherein the taper includes a curved taper.

9. The threaded insert of claim 1, wherein the intersection of the angled faces of the locking portion of the at least one key is positioned substantially flush with the outside diameter of the male threads on the external surface of the bushing portion.

10. The threaded insert of claim 1, wherein the intersection of the angled faces of the locking portion of the at least one key is positioned below flush with the outside diameter of the male threads on the external surface of the bushing portion.

11. The threaded insert of claim 1, wherein the intersection of the angled faces of the locking portion of the at least one key is positioned above flush with the outside diameter of the male threads on the external surface of the bushing portion.

12. The threaded insert of claim 1, further comprising an end surface at the first end of the locking portion of the at least one key, the end surface being substantially perpendicular to the back face and the two angled faces of the locking portion.

13. The threaded insert of claim 1, wherein the entire locking portion of the at least one key extends beyond the first end of the bushing portion.

14. The threaded insert of claim 1, wherein the first side surface and the second side surface of the tang portion of the at least one key have an interference fit with the two walls within the at least one slot of the bushing portion.

15. A threaded insert, comprising:

at least one key, further comprising,

a substantially longitudinal tang portion including a first end, a second end, a first face, a second face, a first side surface and a second side surface, the first face and the second face being substantially parallel and having a curved profile, the first face having a concave surface and the second face having a convex surface, the first side surface being adjacent to the first face and the second face and substantially perpendicular to a tangent along the first face at the intersection of the first side surface and the first face, the second side surface being adjacent to the first face and the second face and substantially perpendicular to a tangent along the first face at the intersection of the second side surface and the first face, and

a substantially longitudinal locking portion, the locking portion including a first end, a second end, a substantially triangular cross section and an end surface, the triangular cross section forming a back face and two angled faces, the second end of the locking portion being positioned adjacent to the first end of the tang portion, the tang portion and the locking portion being substantially longitudinally aligned, the back face of the locking portion being substantially longitudinally aligned with an apex of the first surface of the tang portion, the intersection of the two angled faces projecting

beyond an apex of the second surface of the tang portion, the angled faces tapering into
20 the second face of the tang portion, the end surface being positioned at the first end of
the locking portion, the end surface being substantially perpendicular to the back face
and the two angled faces;

a bushing portion, further comprising,

a substantially cylindrical shape with a first end, a second end and a
25 central bore therethrough,

a surface of the central bore including female threads throughout the
length of the bushing portion, the female threads being configured to mate with a male
threaded fastener,

an external surface of the bushing portion including male threads
30 throughout the length of the bushing portion, the male threads being configured to mate
with a threaded hole in a parent material, and

at least one slot extending substantially longitudinally throughout the
length of the bushing portion positioned on the external surface of the bushing portion,
the slot having a bottom surface and two wall surfaces, the two wall surfaces being
35 substantially parallel to each other and substantially perpendicular to the bottom
surface, the depth of the slot being greater than the depth of the male threads on the
external surface;

the tang portion of the at least one key being positioned within the at least one
slot toward the first end of the bushing portion, the edge between the first face and the
40 first side surface of the tang portion and the edge between the first face and the second
side surface of the tang portion being positioned in contact with the bottom surface of
the slot in the bushing portion, the edge between the second face and the first side
surface of the tang portion and the edge between the second face and the second side
surface of the tang portion having an interference fit with the two walls within the slot
45 of the bushing portion;

the locking portion of the at least one key extending beyond the first end of the
bushing portion; and

the depth of the at least one slot of the bushing portion being sufficient that the apex of the second surface of the tang portion of the at least one key is positioned at a depth deeper than the inside diameter of the male threads on the external surface of the bushing portion and the intersection of the two angled faces of the locking portion of the at least one key is positioned at a depth shallower than the inside diameter of the male threads on the external surface of the bushing portion.

16. The threaded insert of claim 15, wherein the at least one key comprises four keys, the four keys being positioned approximately ninety degrees apart from each other about the circumference of the bushing portion.

17. The threaded insert of claim 15, wherein the taper between the two angled surfaces of the locking portion of the key and the second face of the tang portion of the key includes an angled taper.

18. The threaded insert of claim 15, wherein the taper between the two angled surfaces of the locking portion of the key and the second face of the tang portion of the key includes a curved taper.

19. A method of assembling a threaded insert, comprising:
providing at least one key, further comprising,

5 a substantially longitudinal tang portion including a first end, a second end, a first face, a second face, a first side surface and a second side surface, the first face and the second face being substantially parallel and having a curved profile, the first face having a concave surface and the second face having a convex surface, the first side surface being adjacent to the first face and the second face, the second side surface being adjacent to the first face and the second face, and

10 a substantially longitudinal locking portion, the locking portion including a first end, a second end and a substantially triangular cross section, the triangular cross section forming a back face and two angled faces, the second end of the locking portion

being positioned adjacent to the first end of the tang portion, the tang portion and the locking portion being substantially longitudinally aligned, the back face of the locking portion being substantially longitudinally aligned with an apex of the first surface of the tang portion, the intersection of the two angled faces projecting beyond an apex of
15 the second surface of the tang portion;

providing a bushing portion, further comprising,

a substantially cylindrical shape with a first end, a second end and a
central bore therethrough,

20 a surface of the central bore including female threads throughout the length of the bushing portion,

an external surface of the bushing portion including male threads throughout the length of the bushing portion, and

at least one slot extending substantially longitudinally throughout the
25 length of the bushing portion positioned on the external surface of the bushing portion, the slot having a bottom surface and two wall surfaces, the two wall surfaces being substantially parallel to each other and substantially perpendicular to the bottom surface, the depth of the slot being greater than the depth of the male threads on the external surface;

30 positioning the tang portion of the at least one key within the at least one slot toward the first end of the bushing portion such that the edge between the first face of the tang portion and the first side surface of the tang portion of the at least one key is in contact with the bottom surface of the at least one slot in the bushing portion, the edge between the first face of the tang portion and the second side surface of the tang
35 portion of the at least one key is in contact with the bottom surface of the at least one slot in the bushing portion, and the locking portion of the key extends beyond the first end of the bushing portion; and

applying a force to the second face of the tang portion of the at least one key in a direction substantially perpendicular to the bottom surface of the at least one slot until
40 the curved profile of the tang portion of the at least one key is reduced, an apex of the second face of the tang portion is positioned at a depth deeper than the inside diameter

of the external threads of the bushing portion, and an interference fit is formed between the tang portion of the at least one key and the at least one slot of the bushing portion.

20. The method of claim 19, wherein applying a force to the second face of the tang portion includes applying the force until the interference fit is formed between the walls of the at least one slot of the bushing portion, the edge between the second face and the first side of the tang portion and the edge between the second face and the
5 second side surface of the tang portion.

21. The method of claim 19, wherein applying a force to the second face of the tang portion includes applying the force until the interference fit is formed between the walls of the at least one slot of the bushing portion, the first side surface of the tang portion and the second side surface of the tang portion.